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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,192	09/30/2003	Elliot Paul Douglas	5853-405	5332

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EXAMINER

THOMPSON, CAMIE S

ART UNIT PAPER NUMBER

1774

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/675,192

Applicant(s)

DOUGLAS ET AL.

Examiner

Camie S Thompson

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date rec'd 2/5/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

1. Claim 6 is objected to because of the following informalities: Examiner suggests deleting the term "a" and inserting the term "are". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 7 recites the limitation "energy" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-2, 4-5 and 8-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al., U.S. Patent Number 6,710,366.

Lee discloses a nanocomposite material that can be used in light emitting diodes (see column 56, lines 1-7). The reference discloses that the nanocomposite material comprises a matrix material

and a plurality of quantum dots (nanocrystals) dispersed in the matrix material as per instant claims 1 and 5 (see reference claim 1). Also, the reference discloses that the polymer matrix can be a polysilane as per instant claims 1 and 2 (see column 52, line 23). Additionally, Lee discloses that Group II-IV semiconductor materials such as ZnS, CdSe, CdS, ZnTe, and CdTe can be used as quantum dots as per instant claim 4 (see column 32, lines 36-56). Reference claim 24 recites that each quantum dot includes a core and a shell surrounding the core as per instant claims 8-9. Column 13, lines 15-59 of the Lee reference discloses that the core may be ZnS, CdSe, CdS, ZnTe and the shell may be ZnS, CdSe, CdS, ZnTe.

6. Claims 1-7 and 10-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Shiang et al., U.S. Patent Number 6,703,780.

Shiang discloses an organic light emitting diode comprising a first electrode, a second electrode and at least one light-emitting layer (see column 1, lines 60-68). The reference discloses that the light emitting material can comprise a matrix material containing photoluminescent particles such as CdS, CdSe or ZnSe as per the instant claims (see column 7, line 67-column 8, line 24). Column 12, lines 46-65 of the reference discloses that the light emitting material can be a polysilane such as poly (methyl-phenylsilane) as per instant claims 1-3 and 10-12. The reference also discloses a hole transport layer and an electron transport layer as per instant claims 7 and 14-15. It is disclosed in column 9, lines 5-37 of the reference that the cathode can be calcium, aluminum or a magnesium/silver alloy. Also, in column 9, it is disclosed that the anode can be indium tin oxide as per instant claim 17. Shiang discloses in column 13, lines 34-39 that the

organic light emitting device can emit ultraviolet, blue, green or red light. Column 14, lines 48-68 of the Shiang reference discloses that the device comprises a plurality of pixels as per instant claim 18.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 10 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiang et al., U.S. Patent Number 6,703,780 in view of Lee et al., U.S. Patent Number 6,710,366.

Shiang discloses an organic light emitting diode comprising a first electrode, a second electrode and at least one light-emitting layer (see column 1, lines 60-68). The reference discloses that the light emitting material can comprise a matrix material containing photoluminescent particles such as CdS, CdSe or ZnSe as per the instant claims (see column 7, line 67-column 8, line 24). Column 12, lines 46-65 of the reference discloses that the light emitting material can be a polysilane such as poly (methyl-phenylsilane) as per instant claim 10. The reference does not disclose that the nanoparticles are core-shell particles as per instant claim 19. Lee teaches a nanocomposite material that can be used in light emitting diodes (see column 56, lines 1-7). The reference discloses that the nanocomposite material comprises a matrix material and a plurality

Art Unit: 1774

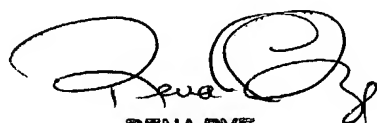
of quantum dots dispersed in the matrix material (see reference claim 1). Also, the reference discloses that the polymer matrix can be a polysilane (see column 52, line 23). Additionally, Lee discloses that Group II-IV semiconductor materials such as ZnS, CdSe, CdS, ZnTe, and CdTe can be used as quantum dots as per instant claim 4 (see column 32, lines 36-56). Reference claim 24 recites that each quantum dot includes a core and a shell surrounding the core as per instant claims 8-9. Column 13, lines 15-59 of the Lee reference discloses that the core may be ZnS, CdSe, CdS, ZnTe and the shell may be ZnS, CdSe, CdS, ZnTe. The core-shell configuration of the quantum dots/nanocrystals affects the electronic and optical properties of the semiconductor materials. Therefore, it would have been obvious to one of ordinary skill in the art to have a core-shell configuration in order to have quantum confinement effects that result in the ability to finely tune the properties of the nanocrystals as per instant claims 19 and 20 (see Lee reference, column 12, line 55-column 13, line 5).

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena L Dye, can be reached at (571) 272-3186. The fax phone number for the Group is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Art Unit: 1774

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RENA DYE
SUPERVISORY PATENT EXAMINER

10/10/04

Art Unit 1774